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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,676	12/06/2001	Ramesh Subramanian	01P23114US	8645
7590	01/18/2005		EXAMINER	
Siemens Corporation Intellectual Property Department 186 Wood Avenue South Iselin, NJ 08830			MARCANTONI, PAUL D	
			ART UNIT	PAPER NUMBER
			1755	

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/010,676	SUBRAMANIAN, RAMESH
	Examiner Paul Marcantoni	Art Unit 1755

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 12/16/04 RCE filing.  
 2a) This action is **FINAL**.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1,3-6,8-10,13 and 14 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 4,9 and 14 is/are allowed.  
 6) Claim(s) 1,3,5,6,8,10, and 13 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \*    c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

Applicant's arguments and RCE filed 12/16/04 have been fully considered but they are not fully persuasive.

Allowed Claims: Claims 4, 9, and 14 are allowed because none of the prior art teaches an amount of stabilizer of yttria or gadolinia of at least 50 wt%.

102/103 Rejections:

The applicants' amendment of claims necessitated the grounds of rejection below:

<u>US Patents Relied Upon:</u>	<u>Claims read upon:</u>
Maloney 6,177,200 B1	1,3,6, and 8
Worrell et al. 4,931,214	1,3,6, and 8
Mase et al. 4,507,394	1,3,6, and 8 and 10 and 13
Kondo et al. 5,789,330	1,3,5, 6, and 8

Claims 1, 3, 5, 6, 8, 10, and 13 are rejected under 35 U.S.C. 102(a and b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Maloney 200B1, Worrell et al. 214, Mase et al. '394, or Kondo '330

Maloney 200 B1 teaches a zirconia coating comprising 5-60 mol% gadolinia and the rest zirconia which also leads to a cubic crystal structure and would appear to anticipate the instant invention (see claims).

Worrell et al. teach a composition comprising 25-98 mol% of cubic zirconia and 1.5 to 25 mol% of stabilizer oxide such as yttrium oxide or yttria. Note that in claim 10 20 mol% yttrium oxide is 37 wt% yttrium oxide so thus the Worrell et al. composition anticipates the instant invention. Further, although Worrell et al. do not teach the same

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intended use as a coating, the new use of a known composition is not a patentable distinction.

Mase et al. teach a composition comprising zirconia and/or hafnia and rare earth oxides in amounts anticipating the instant invention (see claims). Although, Mase et al. do not teach the intended use as a coating, the new use of a known composition is not a patentable distinction.

Kondo et al. '330 teach cubic phase zirconia comprising 0.1 to 40 wt% stabilizer such as yttria, gadolinia, or ytterbia (see col.3, lines 5-15) thus anticipating the instant invention. Note that even if the reference above does not anticipate, overlapping ranges of amounts have been held to be *prima facie* obvious to one of ordinary skill in the art. Kondo et al. teach that a portion of the zirconia is cubic so it still reads upon the applicants' claimed invention. Consisting essentially of does not change this because applicants have not shown that the presence of other zirconia phases such as monoclinic and/or tetragonal with the cubic phase would materially affect the composition and not lead to peak ionic matrix conductivity.

Response:

The applicants argue that with reference to claims directed to the cubic zirconia stabilized with yttria (claims 1, 3-6, 8, and 9) that **Maloney** suggests only a *partial* substitution of zirconia or gadolinia and the resulting composition would or must contain the three oxides of zirconia, gadolinia, and yttria. The applicants use consisting essentially of language in claim 1 which fails to exclude additional components such as gadolinia. When applicants contends that the modifying components in the reference

are excluded by the recitation of “consisting essentially of”, applicants have the burden of showing the basic and novel characteristics of their composition – i.e. A showing that the introduction of these components would materially change the characteristics of the applicants’ composition. In re Delajarte, 337 F 2d 870, 143 USPQ 256 (CCPA 1964). The applicants have provided no showing, experimental or other means, to demonstrate that the presence of gadolinia would materially affect or change the characteristic of the applicants’ claimed composition. The examiner has provided a conversion table from mole% to weight percent for the three component system for zirconia, yttria, and gadolinia (See chart on next page). Note that all represent “partial” substitution of gadolinia and all are proper examples of what is permissible for a Maloney thermal barrier coating composition. As can be seen, the amount of yttria meets the requirements of claims with 30 wt% and even 40 wt% yttria. The amount of gadolinia could be 0.01 mol% and 0.001 mol% and still be present and partially substituted by yttria. This would lead to a yttria weight percent amount closely bordering 40 wt%.

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The chart below represents Maloney 200 B1 coating compositions:

	MW	wt% Ex 1	wt% Ex 2	wt% Ex3	wt% Ex4	wt% Ex5	wt% Ex6	wt% Ex7	wt% Ex8	wt% Ex9	wt% Ex10	mol% Ex1	mol% Ex2	mol% Ex3	mol% Ex4
SiO <sub>2</sub>	60	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
B <sub>2</sub> O <sub>3</sub>	70	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
P <sub>2</sub> O <sub>5</sub>	142	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
GeO <sub>2</sub>	104	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Al <sub>2</sub> O <sub>3</sub>	102	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Li <sub>2</sub> O	30	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Na <sub>2</sub> O	62	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
K <sub>2</sub> O	94	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
MgO	40	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
CaO	56	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
SrO	104	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
BaO	153	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
ZnO	81	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
PbO	224	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
ZrO <sub>2</sub>	122	53.3	60.0	60.5	####	####	####	#DIV/0!	#DIV/0!	####	####	70.0	74.0	74.0	
TiO <sub>2</sub>	80	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
CeO <sub>2</sub>	172	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Sb <sub>2</sub> O <sub>3</sub>	291	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
SnO <sub>2</sub>	151	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
MoO <sub>3</sub>	146	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Fe <sub>2</sub> O <sub>3</sub>	160	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Pr <sub>2</sub> O <sub>3</sub>	330	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
La <sub>2</sub> O <sub>3</sub>	326	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Y <sub>2</sub> O <sub>3</sub>	226	35.3	37.6	39.2	####	####	####	#DIV/0!	#DIV/0!	####	####	25.0	25.0	25.9	
Er <sub>2</sub> O <sub>3</sub>	380	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Yb <sub>2</sub> O <sub>3</sub>	396	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Ta <sub>2</sub> O <sub>5</sub>	442	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Nb <sub>2</sub> O <sub>5</sub>	266	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Nb <sub>2</sub> O <sub>3</sub>	234	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Nd <sub>2</sub> O <sub>3</sub>	332	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
CuO	79	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
CoO	75	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
NiO	74	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
MnO <sub>2</sub>	87	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
Gd <sub>2</sub> O <sub>3</sub>	364	11.4	2.4	0.2	####	####	####	#DIV/0!	#DIV/0!	####	####	5.0	1.0	0.1	
F <sub>2</sub>	175	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
As <sub>2</sub> O <sub>3</sub>	198	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
SO <sub>3</sub>	80	0.0	0.0	0.0	####	####	####	#DIV/0!	#DIV/0!	####	####				
		100.0	100.0	100.0	####	####	####	#DIV/0!	#DIV/0!	####	####	100.0	100.0	100.0	0.0

The applicants argue that Maloney does not teach that his three oxide composition satisfies the limitations regarding ionic conductivity or resistance to sintering. In rebuttal, Maloney teaches an overlapping or nearly overlapping composition with respect to the zirconia-yttria system and because of that it would have been expected that Maloney also has the same properties including ionic conductivity or resistance to sintering.

It is the examiner's position that Maloney '200 B1 does not teach the much higher amount of yttria of at least 50 wt% as set forth in applicants' claims 4 and 9. The examiner also agrees that claims 10, 13, and 14 which is a gadolinia-hafnia coating composition is not within the teaching of Maloney '200 B1. More so, as a result of applicants' amendment of claim 5 from "consisting essentially of" to the most closed claim language "consisting of", the fact that by applicants' argument Maloney '200 B1 must partially substitute and have a "3-component oxide system" of zirconia, yttria, and at least the presence of some gadolinia, rejection over Maloney '200 is also now withdrawn. Claim 5 is limited by consisting of claim language to only zirconia and yttria and Maloney '200 B1 still requires the presence of gadolinia. Thus, Maloney '200 B1 cannot teach the limitations of claim 5 any longer.

The applicants argue that **Worrell et al. '214** does not teach a gadolinia-hafnia coating composition as set forth by applicants in their claims 10, 13, and 14. The examiner agrees and henceforth these claims will not be rejected over Worrell.

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	MW	wt% Ex 1	wt% Ex 2	wt% Ex3	wt% Ex4	wt% Ex5	wt% Ex6	wt% Ex7	wt% Ex8	wt% Ex9	wt% Ex10	mol% Ex1	mol% Ex2
SiO <sub>2</sub>	60	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
B <sub>2</sub> O <sub>3</sub>	70	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
P <sub>2</sub> O <sub>5</sub>	142	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
GeO <sub>2</sub>	104	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Al <sub>2</sub> O <sub>3</sub>	102	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Li <sub>2</sub> O	30	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Na <sub>2</sub> O	62	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
K <sub>2</sub> O	94	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
MgO	40	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
CaO	56	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
SrO	104	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
BaO	153	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
ZnO	81	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
PbO	224	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
ZrO <sub>2</sub>	122	24.0	61.5	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####	25.0	74.5
TiO <sub>2</sub>	80	31.5	0.3	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####	50.0	0.5
CeO <sub>2</sub>	172	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Sb <sub>2</sub> O <sub>3</sub>	291	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
SnO <sub>2</sub>	151	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
MoO <sub>3</sub>	146	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Fe <sub>2</sub> O <sub>3</sub>	160	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Pr <sub>2</sub> O <sub>3</sub>	330	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
La <sub>2</sub> O <sub>3</sub>	326	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Y <sub>2</sub> O <sub>3</sub>	226	44.5	38.2	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####	25.0	25.0
Er <sub>2</sub> O <sub>3</sub>	380	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Yb <sub>2</sub> O <sub>3</sub>	396	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Ta <sub>2</sub> O <sub>5</sub>	442	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Nb <sub>2</sub> O <sub>5</sub>	266	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Nb <sub>2</sub> O <sub>3</sub>	234	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Nd <sub>2</sub> O <sub>3</sub>	332	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
CuO	79	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
CoO	75	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
NiO	74	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
MnO <sub>2</sub>	87	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
Gd <sub>2</sub> O <sub>3</sub>	364	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
F <sub>2</sub>	175	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
As <sub>2</sub> O <sub>3</sub>	198	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
SO <sub>3</sub>	80	0.0	0.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####		
		100.0	100.0	#####	#####	#####	#####	#DIV/0!	#DIV/0!	#####	#####	100.0	100.0

The chart above represents Worrell et al. 214's possible coating compositions.

The applicants would appear to opine under *In re Delajarte* regarding "consisting essentially of" claim language that they can still show such evidence by a separate paper. In rebuttal, it would have been appropriate to provide this evidence at this time in prosecution because it is not a requirement of the examiner to consider affidavits and declarations after final rejection. Please be advised that the submission of after final declaration evidence can be considered untimely and there is no reason why applicants did not provide this evidence beforehand (ie at this point now in prosecution) and may not necessarily be considered for those reasons.

Nevertheless, the applicants argue that the examiner fails to establish a prima facie case that Worrell anticipates any of claims 1, 3-6, 8, and 9. In rebuttal, it would appear that applicants mix terminology for 35 USC 102 and 103 since prima facie refers to 35 USC 103 and anticipation to 35 USC 102. The applicants argue that the examiner cannot make a rejection under 35 USC 102 because it is not set forth in the examples and thus no workable ranges have been provided. In rebuttal, the courts have not themselves settled upon whether cases such as this are anticipation or obviousness and there has been no consensus or guidance from the CAFC or other courts that 35 USC 102 must require a working example or be set forth in an example in the specification. The examiner thus maintains that anticipation still holds with respect to Worrell. Even if it is potentially the case that Worrell's teaching of the applicants' ranges is not anticipated, it is most certainly obvious because he teaches overlapping ranges of the applicants' components and would have been expected to also thus have the same properties such as ionic conductivity.

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Also, regarding Worrell, the examiner has provided examples 1 and 2 of ranges that are permissible as set forth by his claims and it teaches an amount of yttria that can be 44.5 wt% and 38.2 wt% thus meeting the limitations of applicants' claims. The examiner again notes that like Maloney 200 B1, Worrell does not teach an amount of at least 50 wt% stabilizer (the closest is still far enough removed at 44.5 wt% as Worrell's upper limit yttria amounts). Thus, Worrell will not be used in a rejection over claims 4 and 9. Worrell further will not be used in a rejection of claim 5 because applicants now use "consisting of" claim language and Worrell requires three components. Claim 5 is limited to strictly zirconia and yttria and no other component and thus Worrell cannot be used in a rejection over this claim as it contains a third component.

**Mase et al. '394** teach a three oxide composition and thus cannot be used in a rejection of claim 5 which requires strictly only two components of zirconia and yttria. Mase does teach at maximum mole% of yttria of 30 mol% and still reads upon claims 1 and 6. The applicants argue that Mase fails to anticipate any of the present independent claims. The examiner disagrees. Claims 1 and 6 teach overlapping amounts of zirconia and yttria and anticipate or at the very least render obvious these claims. It is also noted again that applicants use "consisting essentially of" claim language, not "consisting of" so arguing that Mase et al. '394 teaches away from their claimed invention does not hold. When applicants contends that the modifying components in the reference are excluded by the recitation of "consisting essentially of", applicants have the burden of showing the basic and novel characteristics of their composition – i.e.

A showing that the introduction of these components would materially change the characteristics of the applicants' composition. In re Delajarte, 337 F 2d 870, 143 USPQ 256 (CCPA 1964). Applicants have not shown that the presence of the third component materially affects their claimed invention through experimental evidence or other means. Also, Mase teaches an overlapping composition and thus properties such as ionic conductivity would have been expected to be the same. It is also noted that Mase teaches a composition that can be 30 mol% yttria, 5 mol% niobium oxide, and 65 mol% zirconia and a composition that can be 30 mol% gadolinia, 5 mol% niobium oxide, and 65 mol% hafnia thus meeting the limitations of claim 10. Mase does not teach an amount of gadolinia of 50 wt% and thus this reference cannot be used to reject claim 14. Applicants are referred to the chart on the following page approximating conversion from mole% to weight % and showing that upon conversion of the above stated amounts for the yttria-niobia-zirconia and gadolinia-niobia-hafnia systems that the amounts of yttria and gadolinia are over 40 wt% respectively.

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The chart below approximates Mase conversion from mol% to wt%.

	MW	wt% Ex 1	wt% Ex 2	wt% Ex3	wt% Ex4	wt% Ex5	wt% Ex6	wt% Ex7	wt% Ex8	wt% Ex9	wt% Ex10	mol% Ex1	mol% Ex2
SiO <sub>2</sub>	60	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
B <sub>2</sub> O <sub>3</sub>	70	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
P <sub>2</sub> O <sub>5</sub>	142	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
GeO <sub>2</sub>	104	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Al <sub>2</sub> O <sub>3</sub>	102	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Li <sub>2</sub> O	30	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Na <sub>2</sub> O	62	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
K <sub>2</sub> O	94	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
MgO	40	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
CaO	56	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
SrO	104	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
BaO	153	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
ZnO	81	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
PbO	224	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
ZrO <sub>2</sub>	122	49.9	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####	65.0	
TiO <sub>2</sub>	80	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
CeO <sub>2</sub>	172	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Sb <sub>2</sub> O <sub>3</sub>	291	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
SnO <sub>2</sub>	151	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
MoO <sub>3</sub>	146	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Fe <sub>2</sub> O <sub>3</sub>	160	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Pr <sub>2</sub> O <sub>3</sub>	330	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
La <sub>2</sub> O <sub>3</sub>	326	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Y <sub>2</sub> O <sub>3</sub>	226	42.7	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####	30.0	
Er <sub>2</sub> O <sub>3</sub>	380	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Yb <sub>2</sub> O <sub>3</sub>	396	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Ta <sub>2</sub> O <sub>5</sub>	442	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Nb <sub>2</sub> O <sub>5</sub>	266	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Nb <sub>2</sub> O <sub>3</sub>	234	7.4	4.5	####	####	####	####	#DIV/0!	#DIV/0!	####	####	5.0	5.0
Nd <sub>2</sub> O <sub>3</sub>	332	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
CuO	79	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
CoO	75	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
NiO	74	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
MnO <sub>2</sub>	87	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
Gd <sub>2</sub> O <sub>3</sub>	364	0.0	42.4	####	####	####	####	#DIV/0!	#DIV/0!	####	####	30.0	
HfO <sub>2</sub>	210	0.0	53.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####	65.0	
As <sub>2</sub> O <sub>3</sub>	198	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
SO <sub>3</sub>	80	0.0	0.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####		
		100.0	100.0	####	####	####	####	#DIV/0!	#DIV/0!	####	####	100.0	100.0

As stated above, **Kondo et al. '330** teach cubic phase zirconia comprising 0.1 to 40 wt% stabilizer such as yttria and ytterbia thus meeting the limitations of claims 1,3, 5, 6, and 8. Kondo et al. do not teach a coating composition of at least 50 wt% stabilizer and thus cannot be used to reject claims 4 and 9. Also, Kondo does not teach a coating composition comprising a hafnia cubic matrix structure and gadolinia and thus cannot be used in a rejection of claims 10, 13, and 14.

The applicants have stated that the ingot material composition will not be the same as a composition for thermal barrier coating because of differing partial pressures of constituent materials of the composition. In rebuttal, the examiner disagrees and notes that Kondo does teach a coating composition. The vapor deposition is a process of coating (see col.1, lines 4-5). Also, the applicants have stated an allegation without the benefit of experimental evidence and thus their position is not convincing in this respect as well. Regarding the applicants reserving the right to provide evidence that their claimed coating and the Kondo coating are allegedly different, this evidence should have been presented with their response at this time in prosecution because it is not a requirement of the examiner to consider affidavits and declarations *after final rejection*. It is in the interests of all involved to sort out these issues before the necessity of making a final rejection. Please be advised that the submission of after final declaration evidence can be considered *untimely* and there is no reason why applicants did not provide this evidence beforehand (ie at this point now in prosecution) and may not necessarily be considered for those reasons.

The applicants also teach intended use is different for their claimed composition versus Kondo. In rebuttal, the new use of a known composition is not a patentable distinction. Further, Kondo still teaches applications such as thermal barrier coatings in the discussion in column 1 and it is the examiner's position that the use appears to be the same as the applicants' use. The applicants further repeat arguments regarding "prima facie case for anticipation" and this is vague because "prima facie" refers to obviousness under 35 USC 103.

The applicants argue that Kondo is a "three-oxide composition" similar to the other references used in the examiner's rejection of claims. The examiner disagrees because only two components can be part of Kondo's composition including zirconia and yttria. The examiner is aware that he changed his position after further consideration regarding this reference because of the reasons to follow and regrets any possible misunderstandings. It is believed that it is correct that Kondo still teaches only two components even with different phases of zirconia other than cubic. Kondo can still read upon the applicants' more closed "consisting of" claim language of claim 5. The applicants argue with respect to claim 5 that the use of consisting of claim language now excludes monoclinic and tetragonal phases. The examiner disagrees. The applicants argue limitations that they do not claim and it is improper to read limitations from the specification into the claims. Claim 5 contains no positive recitation that the zirconia is 100% cubic crystal structure. Also, there is neither a negative limitation that removes the potential for the presence of monoclinic and tetragonal phases. Further, there appears to be no support from the specification for a zirconia that is 100% cubic

crystal structure and contains no residual monoclinic or teteragonal phases. It is possible and potentially probable that the applicants' zirconia can have a cubic structure with residual phases of monoclinic and tetragonal. More so, the presence of the same material (zirconia) in a different phase is not a different component or additive but only a different phase of the same material. The finality of this office action is now proper.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Marcantoni whose telephone number is 571-272-1373. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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Paul Marcantoni  
Primary Examiner  
Art Unit 1755